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drugs and growing plants from the drug garden of the University of Minnesota, at Minneapolis. These photographs have been placed on exhibition by Prof. Newcomb, and their comprehensiveness and mechanical excellence serve to attract considerable attention. Among the chemical exhibits is one that includes both crude materials and finished products. This exhibition from an educational point of view is exceptionally valuable. A collection of magnesia products is interesting in that it serves to show some of the varied uses to which magnesia products are being put at the present time.

The physiological standardization of galenical preparations is everywhere emphasized, and the exhibition as a whole not only serves to call attention to the evolution of pharmacy during a century but also suggests the inevitable and possibly radical development of scientific pharmacy in the very near future.

PUBLIC HEALTH ADMINISTRATION IN YOUNGSTOWN, OHIO.

By CARROLL FOX, Surgeon, United States Public Health Service.

The following report gives the results of a study of health organization and administration in the city of Youngstown, Ohio. The study was carried on from May 15 to July 1, and includes investigations in the office and in the field.

Youngstown is a prosperous community in the northeastern part of the State, located on both sides of the Mahoning River. The city has an area of 25 square miles and includes what was originally an entire township. It is served by four trunk-line railroads: The Erie, Baltimore & Ohio, Pennsylvania, and New York Central. The Mahoning River is not a navigable stream.

Youngstown is essentially an iron and steel manufacturing center. Among its other industries are plants for the manufacture of products made from rubber, gas mantles, oilcloth, mazda bulbs, leather, cigars, etc.

The population figures used in this report were obtained from the United States Census Bureau, which estimates the population as of July 1, 1915, at 104,489. Of this number approximately 65 per cent are foreigners, who work in the iron and steel mills.

Little mention of State law has been made in this report, except as it relates to the powers and duties of the city board of health. Such part of it as is necessary to the subject has already been summarized in the report on health organization and administration in Toledo, Ohio.¹

Adjoining the city of Youngstown, and practically a continuation of it, is the village of East Youngstown, in which is located one of

¹ Reprint No. 284 from the Public Health Reports.

the larger steel mills. This village has a population of about 9,000 people, most of whom are foreigners.

For assistance and information received during the course of this study, acknowledgment is made to the officials of the health and other city departments, the chamber of commerce, especially its secretary and the chairman of the committee on public health, and to those citizens connected with the various charitable organizations or otherwise interested in public health.

ADMINISTRATION AND ORGANIZATION.

The city health organization is under the administration of a board of health, which appoints a health officer as its executive officer. The board, together with its powers and duties, is provided for by statute.

Membership of the board.—The board of health consists of five members, appointed by the mayor. No special qualifications are necessary. The mayor by virtue of his office is president, but the board is authorized to elect a president pro tempore to act in the absence of the mayor.

Term of office of members.—Members of the board are appointed for a term of five years, a term expiring and a new member being appointed each year.

Meetings of the board.—The board meets regularly once a month and as much oftener as is necessary to transact business. Provision is made for special meetings at the call of the president or of three of its members.

Salary and expenses of members.—Members of the board receive no salary.

Powers and duties.—The board of health is given the authority by statute to promulgate regulations for its own government and for the control of disease and the betterment of the public health. Regulations intended for the general public when "adopted, advertised, recorded, and certified" as are ordinances of municipalities, must be recognized by the courts as having the same force as ordinances adopted by the council. For violation of any such regulation there is provided a fine of not to exceed \$100 or imprisonment not to exceed 90 days, or both.

The board must appoint a health officer, but no special qualifications for the position are specified in the statute.

The board may appoint a clerk to have general charge of the records and reports and the proceedings of the board.

With the consent of the council the board may also appoint "ward physicians" and as many persons for sanitary duty as may be required. These latter employees have general police powers and are

designated "sanitary police." All appointments are made according to civil-service regulations.

The board is given exclusive control over its employees. It may define their duties and fix their salaries, and they serve during its pleasure.

The board is further given authority by statute to employ guards to maintain quarantine; to appoint a local registrar under civil-service regulations; to abate "nuisances"; to regulate the location, construction, and repair of "yards, pens, and stables," and the use, emptying and cleaning thereof, as well as of water-closets, privies, cesspools, sinks, plumbing, drains, etc., and to abate all nuisances or correct all conditions detrimental to health or well-being found on school property, by serving notice on the board of education. A fine is provided for failure to comply with an order, and authority is given to the board of health to employ inspectors of schools and school buildings to maintain sanitary conditions.

Where plumbing and sewerage are feasible and necessary but neglected or "refused" in any building, the board may take the necessary action to require correction or may correct the condition, in which event the cost must be assessed against the property.

When necessary, the board of health may impose a quarantine on vehicles of common carriers and may make rules and regulations to restrict communicable diseases disseminated by persons traveling in such vehicles. It is also empowered to investigate houses or localities in which communicable disease is suspected to exist; to quarantine at home or in a suitable place, cases of quarantinable diseases; to placard houses containing certain diseases; to disinfect after communicable diseases; to destroy infected articles or buildings under certain conditions; to provide everything necessary to persons in quarantine, the expense so incurred, except for those measures imposed strictly for the protection of the public health, to be borne by the individual quarantined, if able to pay, and if not, by the municipality; to take measures, supply agents, and afford inducements and facilities for gratuitous vaccination; to close schools and prevent public gatherings during epidemics, threatened epidemics, or when a dangerous communicable disease is unusually prevalent; to maintain health supervision of schools or to cooperate with the school board in maintaining such supervision; to appoint inspectors for maintaining the purity of foods; to inspect maternity boarding houses and lying-in hospitals; to make to the State the necessary reports relating to morbidity and mortality or any special reports required, and to make to the State board of health and the municipal council an annual report on or before January 15.

The activities engaged in by the city board of health are: Registration of births and deaths, control of disease, inspection of milk, meat.

and other foods, laboratory work, abatement of nuisances, plumbing inspection, and collection of garbage by contract.

Personnel.—At present the personnel of the health department, exclusive of the board of health, and their respective salaries, are as follows:

1 health officer (part time).....	\$1, 000
1 secretary and bacteriologist.....	1, 800
1 food and dairy inspector.....	1, 200
1 meat inspector.....	960
1 plumbing inspector.....	1, 800
1 assistant plumbing inspector.....	1, 320
1 chief of sanitary police.....	1, 200
5 sanitary police, at \$960.....	4, 800
2 stenographers, at \$600.....	1, 200
1 stenographer (part time).....	240
1 garbage weight master.....	900
Total.....	16, 420

Office hours.—The office and laboratory, located in the city hall, are open every week day from 8 a. m. until 5 p. m. and Saturdays from 8 a. m. until 12 o'clock noon. There is allowed one hour for lunch. On Sundays and holidays sufficient time is spent in the laboratory by the bacteriologist to perform any emergency work that may be required.

The working hours of the sanitary police conform to those of the office, except that half of the force is on duty Saturday afternoon and emergency work is performed on holidays. The sanitary police are in fact subject to call at any hour, day or night.

All employees are entitled to a vacation of two weeks each year.

Transportation.—The chief of the sanitary police, the milk inspector, and each of the plumbing inspectors are furnished with an inexpensive two-passenger automobile. In addition to the above the health department owns a two-horse ambulance, which is used only for conveying smallpox patients to the detention hospital. Horses are hired as needed. Sanitary police and inspectors of the health department may ride free on the street cars upon showing their badge.

Discussion.—The present health officer is a part-time official and has held his office for many years. He has had, therefore, unusual opportunities to become familiar with the diagnosis and prevention of the common communicable diseases.

It should be noted that Youngstown, except for the bacteriologist, is lacking in those subordinate officials, such as an epidemiologist and public health nurses, who are directly concerned with the control of disease. In carrying out the provisions of State law granting authority to the board of health to appoint sanitary police, it has been the custom to appoint sanitary policemen without technical knowl-

edge rather than sanitary policewomen with the qualifications of public health nurses. As a result of the present organization, it is possible to apply preventive measures only from the old point of view of a supervision over the environment rather than from the modern point of view of a supervision over the individual.

It is obvious that the city of Youngstown is of sufficient size and importance to employ a full-time health officer. It is likewise evident, after a careful study of the situation, that the immediate need of field work of a technical nature is urgent and the amount required great, and that it would be impracticable if not impossible for one whole-time man to perform it and carry on at the same time the necessary administrative duties.

For reasons of economy it would therefore seem wise to defer placing the health officer on a whole-time basis until some future date and to appoint without delay an epidemiologist to devote his entire time to the field work. He would act as the assistant to the health officer and should have as his assistants an efficient corps of public health nurses. Thus the executive work would be performed as at present and new activities would be carried on by the addition of a force of scientific workers.

THE REGISTRATION OF BIRTHS AND DEATHS.

The registration of births and deaths in the city of Youngstown is provided for by statute. The clerk of the city board of health has been appointed local registrar, the city of Youngstown forming a primary registration area. The reports of births and deaths are recorded with care and accuracy, and as nearly as can be determined all of the deaths are registered.

Registration of deaths.—During the year 1915 there were recorded in the health department 1,404 deaths, exclusive of stillbirths, making a crude death rate of 13.4 per thousand. Of these deaths, 116 occurred in nonresidents. Subtracting this figure from the total number of deaths, there remain 1,288 deaths, giving a death rate corrected for deaths in nonresidents of 12.3. To this should be added the unknown number of deaths of residents of Youngstown which occur outside of Youngstown.

There were during the year 1915, 146 stillbirths, a number which might have been decreased by proper prenatal supervision.

Preventable deaths.—There were during the year 1915, 876 deaths ascribed to preventable causes. This is 68 per cent of the total deaths.

The following table gives these deaths more specifically and the indicated death rate per 100,000, together with the number of cases of disease reported to the health department and the indicated case fatality rate.

Deaths registered as from preventable causes; all ages, calendar year 1915.

Disease.	Number of deaths registered.	Indicated death rate per 100,000.	Number of cases reported.	Indicated case fatality rate.
				<i>Per cent.</i>
Typhoid fever.....	21	19.9	97	21.6
Smallpox.....	2	1.9	284	.7
Measles.....	2	1.9	388	.5
Scarlet fever.....	6	5.7	175	3.4
Whooping cough.....	6	5.7	387	1.5
Diphtheria.....	8	7.6	144	5.5
Tuberculosis, pulmonary.....	80	76.5	275	29.0
Tuberculosis, other forms.....	17	16.2		
Pneumonia.....	236	225.8		
Diarrhea and enteritis.....	120	114.8		
Erysipelas.....	3	2.8		
Rabies.....	2	1.9		
Tetanus.....	6	5.7		
Syphilis.....	21	20.0		
Influenza.....	6	5.7		
Dysentery.....	1			
Septicemia, including puerperal.....	18			
Meningitis, tuberculous excepted.....	11			
Bronchitis.....	9			
Abscess.....	2			
Malignant growths.....	62	59.3		
Accidental.....	70	66.9		
Premature birth.....	68			
Congenital debility, lack of care, etc.....	59			
Other conditions peculiar to early infancy.....	40			
Total.....	876			

Infant mortality.—Of the 1,404 deaths in 1915, 379 occurred in infants under 1 year of age. For practical purposes the latter may be classed as preventable. The indicated infant mortality rate for the city during 1915 was 157.1. The accompanying map indicates that the deaths in children under 1 year occur mainly within those sections of the city inhabited by the foreign population. The following table gives the registered causes of these deaths:

Registered causes of deaths in infants under 1 year, mostly preventable, calendar year 1915.

Disease.	Number of deaths registered.	Percent-age of total deaths under 1 year.	Disease.	Number of deaths registered.	Percent-age of total deaths under 1 year.
Scarlet fever.....	1	0.26	Bronchitis.....	2	0.52
Measles.....	1	.26	Pneumonia.....	86	22.69
Whooping cough.....	4	1.05	Diarrhea and enteritis.....	92	24.27
Diphtheria.....	1	.26	Accidental.....	5	1.31
Influenza.....	2	.52	Premature birth.....	68	17.94
Erysipelas.....	2	.52	Congenital debility, lack of care, etc.....	59	15.56
Tetanus.....	1	.26	Other causes peculiar to early infancy.....	40	10.55
Tuberculosis, other forms.....	3	.78			
Syphilis.....	9	2.37			
Meningitis, tuberculous excepted.....	3	.78	Total.....	379	99.90

Registration of births.—There were reported to the health department during 1915, 2,412 births, exclusive of still births, making an indicated birth rate of 23 per thousand.

EPIDEMIOLOGICAL ACTIVITIES.

The Notification of Diseases.

The notification of diseases is required by regulations of the State board of health. These regulations are based on the model law for morbidity reports.

Methods of procedure.—In reporting diseases physicians usually make use of the telephone. The information reported is taken down by a clerk in the health department. It is then transcribed to a card, which is referred to one of the sanitary police for his information. After he has taken the proper action relative to placarding, etc., the card is filed away. Each disease reported is also recorded in a book.

The morbidity report cards supplied by the State board of health are not utilized to any great extent by physicians.

The city reports its diseases to the State board, as required, at the end of each month in a summarized report.

Control of Diseases.

Requirements of regulations.—The regulations of which the following is a summary were passed in 1893 and are rather general in nature. Nothing has been added since that time, except a regulation making chicken-pox a quarantinable disease and an extensive ordinance applying to nuisances and their abatement. The regulation relating to chicken-pox was promulgated in 1915 on account of the prevalence of smallpox.

In the case of certain of the notifiable diseases the health officer is required to placard the premises, and it is unlawful for any person to remove such placard without authority.

Where an attempt is made to conceal the true nature of the disease, it becomes the duty of the health officer to appoint one or more physicians to decide upon the case by actual inspection of the patient.

Within three days after the discharge or death of any patient, the attending physician, or head of the household, must notify the health officer in writing. The health officer is empowered to remove a person suffering with a communicable disease to an isolation hospital, and may require all contacts to be confined within the house or to be removed to the isolation hospital.

School authorities are forbidden to receive into any school a pupil coming from a family in which there is a case of chicken-pox, cholera, yellow fever, typhus fever, smallpox, scarlet fever, diphtheria, measles, or whooping cough, except upon the presentation of a certificate from the health officer. School authorities are forbidden to receive into any school a pupil not vaccinated within the preceding five years unless said pupil has had smallpox. When entering school every pupil is required to bring a certificate from a physician stating that he or she has been vaccinated within the preceding five years or has had smallpox. No child must be permitted by parents or guardians to attain the age of one year without having been vaccinated. No person having smallpox or other communicable disease is permitted to expose himself in the public streets, public conveyances or vehicles, nor is it permitted for a driver or owner of any such conveyance or vehicle knowingly to transport such person. Where a person suffering from a communicable disease has been transported in any public vehicle, the same must be disinfected. It is unlawful to sell,

lend, etc., any clothing, rags, bedding, or other things which have been exposed to infection.

It is forbidden to take a body dead of any one of the diseases mentioned above into any church, lecture room, chapel, or public place. In the case of persons dead of smallpox, cholera, yellow fever, scarlet fever, diphtheria, or typhus fever, directions are given in the regulations for preparing the body, and public funerals are prohibited.

No person, except the physician, is permitted to enter a house where any of the above diseases are being treated, without permission from the health officer, or until the case has fully recovered and the necessary disinfection been practised.

Method of procedure.—The card on which is noted the report of a case of notifiable disease is turned over to one of the sanitary police in whose district the case has occurred. He visits the house and placards it. The card is then placed in the daily reminder file until quarantine has terminated, when it is filed away permanently. After the termination of quarantine a sanitary policeman performs the required fumigation. In the case of typhoid fever a special form has been devised on which is noted the epidemiological data obtained by the chief sanitary police. Every case of suspected smallpox is seen by the health officer. The methods pursued in preventing the spread of communicable diseases are shown in the tabulation.

*Typhoid fever.*¹—The registered death rate per 100,000 from typhoid fever during the year 1915 was 19.9. There were 97 cases reported with 21 deaths. The high case-fatality rate, 21.6 per cent, indicates that there were a number of cases of typhoid fever occurring in the city which were unreported, unrecognized, or concealed.

A study of the typhoid curve by months (Charts 1 and 2) shows two distinct peaks, one in the spring and one in the fall. The epidemiological record of typhoid fever can not be considered sufficiently accurate or extensive to base conclusions upon, but it is likely that much of the typhoid fever arises from contact with patients or carriers, and from flies.

A large percentage of the typhoid fever was found in houses within the sewered districts and the epidemiological records show that of the houses investigated, 76 in number, 55 had sewer connections. The households of 26 only were using city water, the others deriving their drinking water from dug or drilled wells or springs. In seven instances more than one member of a household became infected, the number of cases in each family being as follows: 4, 3, 3, 2, 2, 3, 3.

A study of the methods used at the water purification plant and of the results usually obtained permits one to exclude the city water as a cause of the continuance of typhoid fever.

¹See Charts 1, 2, and 3.

It is estimated that 90 per cent of the milk supply is pasteurized, and a study of the epidemiological records of typhoid fever on file in the health department for 1915 would seem to indicate that milk does not play any part in the spread of the disease. However, the methods of pasteurization are so varied and the technique of operation is so faulty in many instances that milk as a factor in the spread of typhoid fever can not be excluded. A thorough study is necessary relative to the efficacy of pasteurization as practiced in Youngstown.

The surface privy is unquestionably dangerous when open to flies, and all such privies should therefore be abolished. Until this can be accomplished they should be screened. Shallow wells no doubt play a part in the continuance of the infection and should be eliminated as soon as, or where, city water is available.

Smallpox.—There were reported to the health department during 1915, 284 cases of smallpox with two deaths.

Only those cases that occur in persons in boarding houses or hotels, or those who have no homes are taken to the isolation hospital. Other patients are quarantined at their homes, meaning an expense for maintenance which the city is required to meet and frequently the expense of employing guards to enforce quarantine. The former expense in 1915 was \$861.65 and the latter \$1,091.35. The entire cost to the city on account of smallpox during the year 1915, including the erection of a temporary hospital, supplies and attendants for the hospital, maintenance of quarantine at homes and medical services was \$4,724.51. This does not include the time occupied by the health officer and the various sanitary inspectors engaged in inspecting, placarding, disinfecting, etc. Vaccination of contacts is not practiced. The amount of money expended on account of smallpox in a year would furnish vaccine virus sufficient to vaccinate 47,245 persons.

The time has arrived for the question of the prevention of smallpox to be put squarely up to the people, who in vaccination have a rapid and sure method of protecting themselves.

As in other places, the observation is repeatedly made that the foreign-born adult population who have been adequately vaccinated in the old country do not contract smallpox. The disease is prevalent among the native-born unvaccinated population only.

The quarantine of contacts is expensive, antiquated, and inefficient. The expenses involved and necessitated by a failure on the part of the ignorant or misinformed to avail themselves of the only sure means of protection, vaccination, must be borne to a large extent by those intelligent citizens who respect the rights of their neighbors and who therefore protect themselves by vaccination.

It is quite proper for the health officials in dealing with smallpox to limit their preventive measures to the isolation of the patient in an isolation hospital and to the vaccination of contacts, as well as all citizens, including the pupils of the public and parochial schools. The regulations requiring the vaccination of school children are excellent and should be enforced, and in their application the health department should receive the whole-hearted cooperation of the school authorities.

Isolation hospital.—The isolation hospital which the city owned was condemned and demolished. The appearance of smallpox during 1915 necessitated some means of isolation. A temporary hospital was therefore erected on the site of the old hospital. The temporary hospital consists of two small buildings, one of new construction and one a portable schoolhouse. In the former there are two wards heated by a hot-air furnace. This building will accommodate about 18 patients. In the latter building there are a kitchen and two rooms, one for an attendant and one for a nurse. The hospital is furnished with gas, electricity, and water, but no modern toilet facilities are available at present. The cost of this building, including the installation of the lighting and heating system, was \$1,759.17. Smallpox only is isolated in this hospital.

Tuberculosis.—During 1915, 275 cases of tuberculosis, with 80 deaths, were reported to the health department. This gives a mortality of 29 per cent and indicates that many cases of the disease were not notified. The death rate per 100,000 was 76.5. The activities carried on against the disease by either public or private agencies are very superficial and inadequate. The establishment of a corps of nurses in the health department, as well as the appointment of an epidemiologist, would enable the board of health to carry on some very excellent antituberculosis work, as well as other activities that would produce prompt results in the prevention of disease.

The tuberculosis sanatorium.—There was completed about a year ago a hospital which will accommodate approximately 100 patients and cost between \$2,500 and \$3,000 a bed. This hospital was built jointly by five counties, in which are included the cities of Youngstown, Akron, and Canton, in addition to a number of more or less important but less populous communities. The hospital is located 55 miles from Youngstown and near Akron. A hospital not larger than 100 beds is obviously too small to meet the needs of the territory comprised in the five counties. It is in fact too small to isolate the tuberculous of either Youngstown or Akron. It is located too far from Youngstown to be of great benefit to that city. When one considers that there were 80 deaths from tuberculosis during 1915 and at least 80 open cases, which will terminate during 1916, and

that Youngstown has a population of over 100,000, it may be emphatically stated that the city is large enough to warrant the construction of a tuberculosis sanatorium for its own people. It would therefore be wise for the city of Youngstown and the county of Mahoning to make an effort to turn their interests in the five-county hospital over to the other counties, or, for that matter, to the city of Akron alone, with the view that at some future time Youngstown, with the assistance of the county, will own and maintain its own institution for the isolation of tuberculosis.

In addition to the above institution, the county of Mahoning owns an isolation hospital which is built on the grounds of the county infirmary and will accommodate some 14 patients. It is located 10 miles from Youngstown. When the five-county sanatorium was opened the county isolation hospital was closed. It would certainly seem advisable, until the county and city can own a larger institution, that this county hospital be opened as an isolation hospital to be used for the communicable diseases and especially for advanced cases of tuberculosis which will not stand transportation to any distance. Thus the afflicted will be given a place in which to spend their remaining days near friends and relatives. This point is an important one to consider before deciding upon a site on which to construct a tuberculosis sanatorium.

Some advanced cases are now being sent by the county to a makeshift hospital, which is really nothing more than a shack and should be condemned and demolished. It is located within the city in a district where much insanitary property is in evidence.

Pneumonia.—During 1915 236 deaths from pneumonia were reported to the health department, making a death rate per 100,000 of 225.8. Many of the deaths ascribed to pneumonia occurred in children under 1 year of age, this figure representing 22.69 per cent of the total deaths under 1 year.

Diarrhea and enteritis.—Next to pneumonia the high death rate was in the case of diarrhea and enteritis, amounting to 114.8 per 100,000. There were 120 deaths ascribed to this condition, 92 of which were in children under 1 year of age. This figure represents 24.27 per cent of the total deaths under 1 year. Pneumonia and diarrhea and enteritis, together with premature birth and the condition reported as congenital debility, were the principal registered causes of the high infant mortality in the city of Youngstown. All can be classed as controllable. Active work along the lines of child welfare carried on by the corps of nurses mentioned above would undoubtedly result in the saving of many lives and a marked reduction in the death rate of the city.

Discussion.—It has already been pointed out that there are lacking in the health department those employees who are most directly concerned in the prevention of disease, an epidemiologist and public health nurses. In all of the important communicable diseases a careful epidemiological study should be made so that the source of the disease may be determined and preventive measures applied. It is then necessary to follow up by daily visits every case investigated that preventive measures may be adequately taken during the course of the disease and its spread prevented. The former duties are carried on by the epidemiologist, the latter by the public health nurses.

In addition to the epidemiological study, the epidemiologist should be required to render professional services at child-welfare stations and antituberculosis dispensaries, both of which should be opened by the health department without delay. The work contemplated would require the full-time services of a physician familiar with public health work. He should have under him the public health nurses, not less than 16 in number, and the general administrative control of the diagnostic laboratory. There would then be a force adequate to handle the public health question from the modern standpoint of a supervision over the individual harboring the infection as well as a force of sanitary inspectors to exercise a supervision over the environment.

According to modern views the great danger in the spread of disease lies in the individual who is sick with that disease or who is a carrier of the causative organism. Therefore, the logical thing to do in order to prevent the spread of the disease is to isolate the patient. To do this the city is badly in need of a permanent isolation hospital. Such a hospital should be located within easy access. If possible it would be wise to erect it on the grounds already occupied by one of the hospitals of the city, placing it under the general management of that hospital. This is a scheme which has worked out elsewhere satisfactorily.

In addition to an isolation hospital for such diseases as diphtheria and scarlet fever, there should also be provided a sanatorium in which to isolate open cases of tuberculosis found in the city of Youngstown. Such a hospital might be erected with the assistance of the county, or it could be a part of the isolation hospital to be used for other communicable diseases. It is safe to say that a combined hospital of this kind should have not less than 200 beds, 150 for tuberculosis cases and 50 for other communicable diseases. The present temporary hospital could still be utilized for the isolation of smallpox, but as has already been pointed out, if an adequate amount of vaccination is performed there should be no need for a place in which to isolate smallpox.

Tabulation of regulations for the control of the common communicable diseases, Youngstown, Ohio.

Disease.	Period of isolation (patient).	Period of quarantine (contacts).	Circulars of information.	Terminal fumigation.	Treatment of bread-winners.	Exclusion from school and public gatherings.	To be reported by physicians.	To be placarded.	School and public library notified.	Sale of foods prohibited.
Diphtheria.....	Until 2 negative cultures taken 48 hours apart are obtained and not less than 14 days.	Until termination of isolation and 1 negative culture.	None....	Yes....	May be permitted to carry on vocation. ¹	Yes; patient and contacts.	Yes....	Yes....	Yes....	Yes. ²
Scarlet fever.....	Until disappearance of desquamation.	Until termination of isolation.	None....	Yes....	Same....	Same....	Yes....	Yes....	Yes....	Yes. ³
Measles.....	Until 10 days after placarding.	Until termination of isolation (in immunized children only).	None....	No....	No restriction on adult members of household.	Yes; except those who have had measles.	Yes....	Yes....	No....	No.
Smallpox.....	Until disappearance of all scales.	Until termination of isolation, after which observation for 14 days.	None....	Yes....	May be released after vaccination.	Yes; patient and contacts.	Yes....	Yes....	Yes....	Yes.
Chicken-pox.....	None. ⁴	None....	None....	No....	No restriction....	Yes; patient only.	Yes....	Yes....	No....	No.
Whooping cough.....	Yes; until through whooping.	None....	None....	No....	Same....	do....	Yes....	Yes....	No....	No.
Typhoid fever.....							Yes....	Yes....		Yes. ²
Tuberculosis.....			Yes....	Yes....			Yes....			

¹ Except when vocation brings him in contact with children or general public.

² Some one not in contact with patient and with negative culture permitted to carry on the business.

³ No one coming in contact with patient allowed to handle food products.

⁴ Most cases, especially in adults, examined to exclude smallpox.

Diagnostic Laboratory.

The diagnostic laboratory of the city board of health has been in existence some 17 years, although it is only in recent years that it has received adequate recognition from the legislative body. At present it is housed in a well-lighted room in the city hall in connection with the offices of the board of health and is well equipped to do any work that may be required of it.

The laboratory is in charge of a bacteriologist, who is also the secretary or clerk of the board of health as well as the chemist and the local registrar.

The routine work carried on in the laboratory consists of the examination of cultures for diphtheria, the examination of sputum for tuberculosis, and in the case of typhoid fever, of blood for the Widal reaction or blood cultures for the causative organism. In addition, daily examinations are made of the city water supply, and milk samples collected by the milk inspector are examined for visible dirt, specific gravity, and butter fat.

Method of procedure.—The laboratory issues to physicians free of charge specimen outfits for the submission of material to be examined for diphtheria, tuberculosis, and typhoid fever. In the case of diphtheria, two test tubes, each containing a sterile swab, are furnished, one swab to be used for taking specimens from the throat and one for taking specimens from the nose. Loeffler's blood serum is inoculated from the swab, incubated at 35° C. for 18 hours and smears, then treated by Kinyon's modification of Ponder's stain.

In the case of tuberculosis, wide-mouthed bottles containing a small amount of carbolic acid solution are furnished. Material is stained in the usual way.

To transmit blood to be tested for the Widal reaction, an aluminium foil is furnished, or for blood cultures, a test tube containing oxbile. The latter is corked and sealed with paraffin.

The specimens of water submitted twice daily by the superintendent in charge of the city water works are three in number, one a sample of the raw water, one the water after sedimentation, and one after filtration. Bacterial counts on agar at 20° C. are made from each sample as well as a determination as to the presence of the colon bacillus. The latter is accomplished by planting in lactose bile fermentation tubes. Of the raw water $\frac{1}{2}$ c. c. is used, experience having shown that the colon bacillus may usually be found in that amount. Of the filtered water samples, 1 and 10 c. c. are planted. Tubes showing gas are planted on neutral red-lactose-bile-agar and incubated. Colonlike colonies are then tested in lactose, dulcitol, and saccharose broths and also for indol.

In the case of milk, bacterial counts are not made. The routine examination consists of filtration through a cotton disk to determine

the presence of visible dirt, the use of the lactometer to determine the amount of solids, and the Babcock test to determine the amount of fat.

The cost of operating the laboratory during the year 1915 amounted to \$2,075.70, including the salary of the bacteriologist. There were made during the same period 5,092 examinations, making a cost per examination of 40 $\frac{2}{3}$ cents.

Tabulation of examinations made in the laboratory, calendar year 1915.

	Positive.	Negative.	Total		Positive.	Negative.	Total.
Typhoid fever:				Milk.....			1,673
Blood cultures.....	8	29	37	Cream.....			15
Widal tests.....	5	34	39	Water:			
Tuberculosis.....	161	379	540	Well.....			53
Diphtheria:				City water.....			1,689
For diagnosis.....	72	391	463	Total.....			5,092
For release.....	95	497	592				

MUNICIPAL ENGINEERING ACTIVITIES.

The Water Supply.

The municipal water supply is taken from the Mahoning River within the city limits, above the outlet of all municipal sewers. This river receives pollution along its entire course, but more especially from the larger municipalities of Warren, Niles, and Girard. In addition great quantities of industrial waste are cast into it from the various iron and steel industries along its banks. The water therefore contains a large amount of suspended matter, both organic and inorganic in composition.

The water furnished to the city is first purified by means of mechanical filtration.

There are two sedimentation basins with a capacity of 4,000,000 gallons each. During 1915 both alum and copper sulphate were used in the process of purification, the former in amounts averaging 2.35 grains per gallon and the latter in amounts averaging 1 part per million. The addition of copper sulphate not only eliminated the growth of algæ which were becoming objectionable, but also seemed to have a marked beneficial influence on the purity of the filtered water. Since the rise in price of copper sulphate its use has been discontinued and alum alone used. This coagulant is mixed in tanks, from which it passes into a well. From here it is sucked by the action of the pumps directly into the pipes conducting the raw water to the sedimentation basins. Upon entering a basin the flow of water is directed back and forth by two baffle walls to a final compartment which it enters from below. Having traversed this compartment it passes over a weir into the pipe leading to the filter beds.

The filter beds are 28 in number, 16 of them in use and 12 in the process of construction. Each of the former is capable of furnishing approximately 850,000 gallons of water and each of the latter is designed to furnish 1,000,000 gallons of water per day. The filter material is composed of three layers of gravel in different sizes and 3 feet of sand. The filters are washed from below by filtered water, agitation being produced by compressed air.

No chlorine treatment is used. About $2\frac{1}{2}$ per cent of the filtered water is required as wash water. Approximately 10,000,000, or 95 gallons per capita, are furnished to the city daily.

Water is supplied to the low-lying portions of the city by direct pressure from centrifugal pumps, while in those parts of the city with higher elevation, pressure is maintained by means of standpipes.

The entire plant is modern both in construction and operation. Work is now in progress to improve certain of the details relative to preliminary treatment.

During 1914 there was but one month, October, in which the average percentage of efficiency of the filters was below 97. During this year of efficient service the maximum number of deaths from typhoid fever in any fall month was three in September. In the year 1915, during the same period there was an increase in the number of deaths from typhoid, there having occurred four in September and five in October. During May, June, and July the filters did not operate to the degree of efficiency to be desired and colon bacilli were present in 10 c. c. samples for an unusual number of days in each month from May until November. This condition usually occurs after heavy rains. While it is thought that the city water plays no part in the spread of typhoid, yet it would seem wise to take some additional safeguards by installing a chlorine plant to be used only when filtration alone does not produce the desired results.

It would also seem advisable to provide adequate methods for disposal of industrial waste products above the intake of the water supply. Such products are now passed into the river untreated.

There are still in use in the city a number of wells of varying depths. The shallow wells at least should be abolished where city water is available.

There is at present a dam under construction in the Mahoning River and located 37 miles above Youngstown, which will impound 10,000,000,000 gallons of water. This will furnish the city at times of low water a reserved supply for both domestic and industrial purposes.

The following tables give in some detail the results of the analysis of water supplied to the city for domestic purposes.

Tabulation of results of the examination of 560 samples of the city water supply, calendar year 1915.

	½ c. c.		1 c. c.		10 c. c.		Number of days present in ½ c. c. or less.	Number of days absent in 1 c. c. or less.	Number of days present in 10 c. c.	Number of days absent in 10 c. c.
	+	-	+	-	+	-				
January:										
Raw.....	43	1	12	32			24	0		
Settled.....			1	43	3	41	12	12		
Filtered.....							1	23	3	21
February:										
Raw.....	42	1					24	0		
Settled.....			14	29			11	13		
Filtered.....			0	43	0	43	0	24	0	24
March:										
Raw.....	49	1					27	0		
Settled.....			5	45			5	22		
Filtered.....			0	50	0	50	0	27	0	27
April:										
Raw.....	48	0					26	0		
Settled.....			35	13			11	15		
Filtered.....			2	46	3	45	1	25	2	24
May:										
Raw.....	46	0					26	0		
Settled.....			23	23			20	6		
Filtered.....			2	44	7	39	2	24	4	22
June:										
Raw.....	47	1					26	0		
Settled.....			26	22			20	6		
Filtered.....			3	45	18	30	3	23	10	16
July:										
Raw.....	48	0					27	0		
Settled.....			35	13			22	5		
Filtered.....			10	38	24	24	8	19	14	13
August:										
Raw.....	47	1					26	0		
Settled.....			24	24			18	8		
Filtered.....			4	44	11	37	4	22	7	19
September:										
Raw.....	45	2					26	0		
Settled.....			14	33			10	16		
Filtered.....			1	46	8	39	1	25	6	20
October:										
Raw.....	43	2					25	0		
Settled.....			18	27			14	11		
Filtered.....			1	44	9	36	1	24	7	18
November:										
Raw.....	42	3					25	2		
Settled.....			7	38			6	21		
Filtered.....			0	45	8	37	0	27	6	21
December:										
Raw.....	48	0					27	0		
Settled.....			5	43			6	21		
Filtered.....			0	48	1	47	0	27	1	26

NOTE.—A day free from colon bacilli means a day during which no colon bacilli were found in either of the daily samples examined.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Raw water.....	1,323	740	572	1,175	201	213	240	298	247	414	635	2,631
Settled water.....	40	17	11	155	27	30	36	57	11	19	11	24
Filtered water.....	2	1	2	54	37	89	16	23	3	3	2	3
Percentage of efficiency.....	98.38	99.77	99.33	94.80	89.41	76.32	80.56	94.0	97.71	99.08	99.20	93.79

The Disposal of Sewage.

Sewage is passed into the Mahoning River untreated. Located between the intake of the water supply and the highest sewer outlet is a dam.

There are few districts in the more populated sections of the city where sewers are not available. In one there are no sewers at all.

Here it was planned to lay the necessary pipes and secure the necessary grade for the main by carrying it through one of the city parks to the river. For some reason, which is not apparent, the plan was opposed and work has, therefore, not commenced. This sewer should be laid without further delay. In two other sections of the city the sewers are laid, but as yet they have not been provided with outlets; therefore, houses in those sections have not been able to connect. There are in the city at present 141 miles of sewers, main and lateral.

The method of connecting to the sewer through the medium of a catch basin as practiced in Toledo is not permitted in this city.

Plumbing.—The inspection of plumbing comes within the jurisdiction of the health department. The work of the plumbing inspectors is closely associated with that of the building department of the city and, therefore, the inspectors of plumbing occupy offices in common with that department. It is suggested that it would be advisable to transfer the division of plumbing inspection to the building department.

The plumbing code is patterned after the State law, but has been simplified wherever possible and consistent with safety. It is therefore practicable to install a simpler system of plumbing than is permitted in some other places.

Every action which tends toward simplicity in the plumbing code and reduction in the expense of installing plumbing is to be encouraged and commended.

The Collection of Garbage and Rubbish.

The collection and disposal of garbage.—The collection of garbage is done by contract under the supervision of the city board of health. This board, out of money appropriated for the purpose, pays \$2.25 for every ton collected. The amount expended in this way amounted in 1915 to \$22,514.99 and represents the collection of 10,006 $\frac{3}{4}$ tons of garbage, or approximately 27 $\frac{1}{2}$ tons per day. The garbage is collected in iron, end-dump wagons, with a capacity of approximately two tons. The regulations require that these wagons be kept covered by a canvas cover. To facilitate collections the city is divided into seven districts—a business and six residential districts. From the former, garbage is collected daily in summer and four times a week in winter. From each of the residential districts, collections are made twice a week in summer and once a week in winter. The garbage is taken to a central station where it is weighed by an employee of the health department and then loaded into cars and transported to the reduction plant. The cost of transportation and reduction is borne by the department of service of the city, which pays the reduction plant 45 cents for every ton reduced. The reduction plant is privately owned. In the process of disposal the garbage is first dried.

It is then treated with gasoline to extract the fats, after which it is dried again, ground and used as an ingredient for the manufacture of fertilizer. The offensive gases are given off during the first drying process. They are passed through washers before discharge through the chimney. In connection with this plant for garbage reduction, there are likewise retorts for handling dead horses or other large animals.

The collection and disposal of rubbish.—The city has little or nothing to do with the collection of rubbish. It is carted away according to the whims of the householder and at his expense. The city, however, does maintain an incinerator for the destruction of rubbish. This incinerator was built in 1898 for the cremation of garbage, but is now out of date and too small to be used for that purpose. Small dead animals are collected at the rate of 50 cents for a dog and 25 cents for a cat by anyone who will undertake the job. They are burned at the incinerator with the rubbish. It cost the city \$264.25 during 1915 to collect small animals.

Discussion.—It is thought that it would be desirable to have the city operate its own system for the collection of garbage. This change could be made when the present contract has expired. At the same time a system of rubbish collection should be inaugurated. These two classes of refuse may be collected without a duplication of equipment as the same wagons may be utilized to haul garbage and rubbish alternately.

After the first expense involved in acquiring equipment it is believed that the city can collect its own garbage at a figure lower than it is now paying under contract and at the same time have on hand the machinery with which to collect other city waste. This plan should be considered before another garbage contract is let.

In this connection it might be pointed out that during 1914 the city of Toledo collected garbage and delivered it to the reduction plant at approximately \$2.10 per ton. The privately owned reduction plant charged the city 22½ cents per ton for disposal.

It is not at all unlikely that the amount of garbage collected in Youngstown during 1915 does not represent the total amount of garbage produced by the city. Estimating the amount at one-half a ton per 1,000 inhabitants there should be approximately 50 tons per day, as against an average of 27½ tons actually collected. It can be said with certainty that there is quite a lot of garbage mixed with rubbish and which is therefore not collected as garbage. This together with the garbage produced in the outlying rural sections of the city might account for the discrepancy.

It should also be pointed out that rubbish, provided it contains no garbage, is valuable as a fill to reclaim low-lying areas of the city. Thus land is made valuable which would be otherwise worthless.

Such filling should be done under the supervision of a city employee, so that the method will not lead to any objectionable results. One must keep in mind that such fills, while they may be unsightly for the time being, are not insanitary.

PUBLIC HEALTH SOCIAL SERVICE.

Health Supervision of School Children.

The health supervision of school children is carried on by the educational authorities under the direction of the health officer.

There are engaged in the work four medical inspectors who receive \$10 a day for 20 days at the beginning of the school year, in which time they are expected to complete their duties. There are also engaged in the work two specialists on the eye, ear, nose, and throat, who furnish treatment without remuneration to children referred to them. Four nurses at \$80 per month are engaged during the school year only.

Methods of procedure.—Children in high and parochial schools are not examined.

Each child is given a card which follows it throughout its school life. On this card is noted any defect as well as the result of treatment. Where treatment is necessary notification blanks in duplicate are made out, one of which is sent to the family and one given to the nurse, whose duty it is to follow up the case. Where the patients are unable to pay for medical services they are either referred to one of the two specialists mentioned above and treated at the free dispensary of the Youngstown hospital, or given a card of admission to one of the hospitals, if hospital treatment is necessary. Throughout the entire school year nurses are required to visit schools daily for the purpose of detecting beginning communicable diseases or other conditions requiring attention, to follow up cases as they may think necessary, to visit the homes of children reported absent by the principal and by talks or otherwise to instruct the pupil in personal hygiene. In their work they cooperate with the health department as well as the truant officer.

No dental clinic has been established, but inspection by both physicians and nurses is made to include the teeth and some dental work is performed by the dentists of the city free of charge.

Medical clinics are frequently held in the school, to which parents and family physicians are invited. At these clinics the child is thoroughly examined by the four medical inspectors, and defects are pointed out to the parents, together with the necessity for treatment. The object is in large measure an educational one.

There has been inaugurated in some of the schools the pupil health officer and pupil nurse system, whereby the boy and girl

appearing neatest during the week are appointed health officer and nurse, respectively, for duty during the coming week. This is said to be a great incentive to improvement in matters of personal hygiene.

The toothbrush drill is also required and each pupil made to own a toothbrush.

The educational authorities will furnish glasses free of charge to worthy cases.

During 1915 the medical inspectors inspected 13,166 pupils. Only those pupils are given a thorough examination who, in the opinion of the inspectors, require it. Much is left to the discretion of the inspectors. There were found 7,895 defects, of which 2,273 were corrected. The nurses made 1,694 visits to the homes.

The Visiting Nurses' Association.

The visiting nurses' association is supported by private philanthropy. There were employed during 1915 10 nurses, and there was available to defray the expenses of the organization during the same period the sum of \$10,000. There have recently been added 3 additional nurses to the corps on account of the child-welfare work, which will be carried on through the summer months of the present year.

The nurses visit the indigent sick who are in need of nursing services. Their duties include assistance rendered to those suffering from communicable diseases such as tuberculosis, typhoid fever, measles, and scarlet fever, as well as activities along the lines of child-welfare and prenatal care. The work is also of an educational nature, as instruction is given, by word and practice, along the lines of preventive medicine. It may be said, in fact, that many of the duties of these nurses are distinctly of a public-health nature and performed for the benefit of the public health.

Child-Welfare Work.

Except for the work performed by the visiting nurses' association as part of its routine, there has been no special activity carried on to prevent the unnecessary deaths among infants causing the high infant mortality rate of 157.1. Recently there has been raised through private charity \$1,500 for work of this kind to be performed during the summer months of the present year. This work will be done through the agency of the visiting nurses' association, who have added for the purpose three extra nurses to their corps. Infant-welfare stations will be opened in several parts of the city.

Antituberculosis Activities.

Where active field work is performed along the lines of the prevention of tuberculosis it is done by the visiting nurses' association. There is a society, however, which raises a small amount from the sale of Red Cross seals. This money is spent in furnishing supplies to those who are worthy and who are afflicted with tuberculosis. A certain amount of this money is also used to defray the expense of maintaining a very limited number of beds in the tuberculosis sanatorium. No antituberculosis dispensaries are operated.

The work performed by the health department toward preventing tuberculosis and the tuberculosis sanatorium have already been mentioned (pp. 2662-2663).

Discussion.

It is generally agreed that a corps of public health nurses is the most important part of any health department. The work that they perform should be productive of the best results. There is hardly a field in the whole science of preventive medicine in which their services can not be employed to advantage. It is therefore most essential that the health department have a corps of such employees at its command. The number should not be less than 16. The city should then be divided into 16 districts and a nurse placed in each district. The poorest and most thickly populated sections of the city should be divided into the smallest districts. Each nurse should then perform within her district all the duties required of a public health nurse. At the present time it is quite impossible for the city, for financial reasons, to employ and pay 16 nurses, but it is quite possible by a combination of the nursing forces now employed by other bodies to attain the same results, for the time being at least.

According to modern views, it is in the interest of efficiency and economy to combine all the forces employed in public health work and place them under one controlling head. It would, therefore, seem advisable to combine the nurses of the Visiting Nurses' Association and the school nurses engaged by the board of education and to enlarge the force by the addition of four nurses to be employed by the board of health. A combination like this would make available 21 nurses. Reserving five for general nursing, or what might be strictly spoken of as charitable work, there would remain 16 nurses to carry on the necessary public health activities. The latter would be engaged in prenatal and infant welfare work, school nursing, and duties in connection with the control of the communicable diseases.

As much of the work of these nurses would be carried on at the homes of industrial workers, who represent a large part of the population, it might be possible to enlist the cooperation of the large

steel industries, so that they would be willing to employ some additional nurses, thus adding to the force and making it possible to reduce the size of the districts.

It is unfortunate that the city government is not in a position to pay the salaries of an adequate corps of nurses. The work that they perform, as contemplated herein, is strictly speaking public health work and, therefore, a legitimate governmental function.

FOOD INSPECTION.

Food inspection as carried on by the health department of Youngstown will be taken up under the following headings:

The control of the milk supply.

The inspection of meats and other foods.

The Control of the Milk Supply.

The control of the milk supply of communities in Ohio is placed by statute in the hands of the local boards of health. State law also makes provisions for the maintenance of the purity of milk. In addition the board of health of Youngstown has promulgated regulations setting a standard for the purity of milk and requiring that certain precautions be taken in its production and sale.

Requirements of regulations.—All places where milk is sold or handled must be licensed by the board of health. Before such license is issued the place must be inspected by the dairy inspector.

No milk is allowed to be sold in the city unless it has come from cows which have been tuberculin tested and shown to be free from tuberculosis. Any person selling milk from untested cows will have his permit revoked.

No person is permitted to bring into the city for sale or delivery or to offer for sale any milk—

1. That contains more than 88 per cent of water or fluids, less than 12 per cent total solids, or less than 3 per cent of butter-fats.
2. That has had any part of the cream removed.
3. That has a specific gravity of less than 1029.
4. That contains any foreign chemical.
5. That contains pathogenic bacteria.
6. That contains more than 500,000 bacteria per cubic centimeters.
7. That is drawn from a cow having a communicable disease, or a cow from a herd having or exposed to any communicable disease.
8. That is drawn from a cow 15 days before or after parturition.
9. That is drawn from a cow fed on garbage, distillery waste, or other improper food.
10. That has a temperature or has been kept at a temperature above 65° F.
11. That has not been kept under conditions required by the regulations.

The first three provisions do not apply to milk sold under the name of skimmed milk.

For laboratory purposes the standard for the cleanliness of milk is based on a determination of the visible dirt present in one-half pint after filtering through a cotton disk from three-fourths to 1 inch in diameter. By this standard "clean milk" is milk that does not leave more than 6 particles of dirt nor tint or color the cotton except with

fat. From this there are three gradually lowering standards comprising "fairly clean milk," "dirty milk," and "filthy milk." The two latter grades may not be sold or brought into the city.

Vehicles from which skimmed milk is sold must be distinctly labeled in letters not less than 1 inch in height with the words "skimmed milk," or if the milk is not sold from a vehicle each vessel must be so labeled as to show that it contains skimmed milk. Skimmed milk must contain at least 9 per cent milk solids. No person is permitted to sell milk in quantities less than 1 gallon, except in sanitary bottles suitably capped, unless the milk is sold from a milk house or dairy, when it may be dipped. The milk house must not be located less than 15 feet from a privy vault or cesspool.

In addition to the above the regulations provide for the location of storage plants for milk, the cleanliness of wagons, the labeling of wagons, the covering of wagons, the bottling of milk, the removal of employees from houses containing communicable diseases, the sealing of containers, taking samples, etc.

Dairies are required to be scored, the score card providing for the condition of the cow, the stable, the water supply, the milk house, the health of attendants, and the cleanliness of milking. Scores are made on the basis of 1,000 points.

Methods of procedure.—There is but one man engaged in the supervision of the milk supply. He is required to inspect and score producing farms, to exercise a general control over pasteurizing plants and places selling milk and to collect samples for analysis. In addition he is required to inspect perishable foods offered for sale.

Samples of milk are collected in the early morning, and are taken with as little delay as possible to the laboratory of the health department. Here they are subjected to three tests, the lactometer test to determine the amount of solids, the sediment test to determine the amount of visible dirt, and the Babcock test to determine the amount of butter fat. The laboratory standard for clean milk is based on the amount of visible dirt. This test alone does not seem to be adequate, but in connection with the bacterial count the information obtained by this means would be of value.

The inspector determines the temperature of the milk while on the wagons, and if it is below the standard (65°) it is returned to the producer.

During this survey an inspection was made of a number of the producing farms, and while a few might be classed as good, many were far from satisfactory. All had the milk house separate from the barn and all were cooling milk by one means or another, some in a very primitive way. A few use ice in the process of cooling, and a very few ice the bottles while delivering to the consumer. Generally speaking, barns were poorly ventilated and dirty, although occasionally one was found to be in excellent condition. Allowance must be made because of the time of year, the farmers being more interested in planting their crops than in maintaining the sanitary condition of their barns. To a large extent the business of dairying is carried on merely as a side issue to agricultural pursuits.

Inspections were also made of the pasteurizing plants. The methods of pasteurization differ widely, some using the "holding" and some the "flash" system. One plant pasteurizes in the bottle. Many of the plants are too small for the purpose, sanitary conditions are not maintained as they should be, and the technique of the operation is poor. Necessarily the time and temperature of pasteurization vary greatly and no plant is supplied with a thermoregulator or temperature recorder.

A provision of the regulations requires that milk sold in quantities less than 1 gallon must be bottled at the dairy. Therefore, all milk which is not pasteurized is bottled at the producing farm, either by machine or by hand. Capping is also accomplished mostly by hand.

Discussion.—The investigation of the milk supply shows conclusively that it is absolutely impossible for one man to properly handle the situation and that it is essential that a thorough study, both in the field and in the laboratory, be made of the different processes in use in the production of Youngstown's milk supply. This will mean the addition of at least one milk inspector, making one for dairy inspection and one for city milk inspection. A thorough study should be made of the operations of each pasteurizing plant. Samples should be collected from the farms producing the milk, from the plant before the milk goes into the pasteurizer and after it is pasteurized, and from the bottle as delivered to the consumer.

These samples should be examined for bacterial content. It is doubtful whether some of the pasteurizing plants are getting the results to be expected from pasteurization. After a careful study has been made it will probably be found necessary to require each plant to use the "holding" method and pasteurize at a temperature of 145° for not less than 25 minutes. The installation of a thermoregulator and a temperature recorder at each plant should be compulsory. It would then be as well to require the pasteurization of all milk sold in the city of Youngstown, except only milk produced under the standard set for certified milk. Certified milk is now sold in Youngstown from a farm producing certified milk for the Allegheny County Medical Society of Pennsylvania.

Tabulation of information relative to milk supply, city of Youngstown, Ohio.

Number of milk samples analyzed in laboratory, 1915.....	1, 673
Grade 1, "Clean milk".....	417
Grade 2, "Fairly clean milk".....	840
Grade 3, "Dirty milk".....	395
Grade 4, "Filthy milk".....	21
Butter fat above standard.....	1, 569
Butter fat below standard.....	98
Total solids above standard.....	1, 177
Total solids below standard.....	496

Samples of cream examined, 1915.....	15
Number of producing farms.....	862
Number of pasteurizing plants.....	17
Pasteurizing by holding method in bulk.....	10
Pasteurizing by holding method in bottles.....	1
Pasteurizing by flash method.....	6
Daily consumption of milk.....gallons..	8, 820
Daily consumption of cream (family use and ice cream).....do....	290
Longest haul by wagon or truck.....miles..	15
Longest haul by electric car.....do....	20
Longest haul by train.....do....	50
Percentage of milk supply pasteurized (estimated).....per cent..	90

Inspection of Meats and Other Foods.

Meats.—There are no slaughterhouses under Government supervision. The ante and post mortem inspection of animals in the local packing house is performed by an inspector of the health department. His entire time is taken up with this work and that of inspecting butcher shops. Some slaughtering on a small scale is done outside of the city limits. The meat is brought into the city for sale, but is not inspected, mainly on account of the difficulty in determining when and where it is to enter the city.

Other foods.—There is no organized food or restaurant inspection. The inspection of perishable foods, fruits and vegetables especially, is made by the milk inspector, who is also required to give such time as he may to the inspection of other places selling food or other food products. It is obvious that it is impossible for one man to carry on this work as well as the milk inspection.

An inspection of restaurants is also made a part of the routine work of the sanitary police. No scoring of any kind is done.

Except for milk, the laboratory does not perform any analyses to determine the quality of food products.

Discussion.—The health department should be provided with an inspector, whose duties would be chiefly concerned with the inspection of places selling foods as well as the products sold therein. These places would include restaurants, bakeries, stores, markets, and the like. Thus, with an inspector for this purpose, one meat and one sanitary inspector already employed, and an additional milk inspector, the city would have the minimum force with which to supervise the food supply from the public health standpoint.

All places handling food should be scored and the results published.

Regulations should be promulgated to maintain sanitary conditions and to prevent those suffering from communicable diseases from handling food.

All meat slaughtered outside of the city limits without inspection and brought into the city for sale should be taken to a central point, so that the city meat inspector might inspect it with facility.

THE SANITARY POLICE.

The sanitary police force is composed of six uniformed men, one of whom is the chief sanitary inspector. Their duties are mainly concerned with the abatement of nuisances and the placarding and fumigation of premises for communicable diseases.

The city is divided into five districts in order to facilitate the work.

Once a year a survey is made with reference to the sanitary condition of the different premises within the city. The results of the inspection are noted on blank forms, devised for the purpose, which include spaces to state the condition of the house, cellar, yard, and the character of toilet facilities. Where orders are issued to abate nuisances disclosed as a result of this survey reinspections are required.

Discussion.—The enforcement of the law requiring sewer connections, the fly proofing of privies, which for any reason may not be connected to the sewer, the elimination of shallow wells, the prevention of the accumulation of manure, the enforcement of the regulation requiring that all premises be furnished with a garbage tin and the enforcement of a housing code are the important duties of a sanitary inspector. Successful work along these lines alone would go far to improve the public health.

It is to be regretted that the inspectors can not devote their entire time to such duties. This, however, is impracticable because the average citizen has a false conception of the duties of a health department. He believes that pestilence arises from the collection of ashes or old bottles in the adjoining lot, sewer gas, a dead dog in the street, the neighbor's chicken yard, bad odors and the like, and therefore everything that offends the special senses is reported to the health officer as dangerous to health. It is in attending to such matters that the sanitary police are required to perform a great deal of work which has little or no bearing on the public health, and which is a reason why many health departments are devoting a greater part of their energies and appropriations to things that count for little or nothing in the prevention of disease and are unable to perform those duties which are of real importance. This unfortunate condition must be attributed largely to the various health departments, which have neglected to educate the people along the lines of modern thought in public health work. Many health departments of the present day are still using antiquated methods, and so long as the people think that everything unsightly must necessarily be insanitary, health departments are compelled to expend the bulk of their money in performing duties that do not concern the public health. Thus it is difficult to secure funds to make much-needed reforms.

Many of the complaints that now come to the health department should be made to the police department, and it should be the duty of that department to have such nuisances abated. In fact the modern view contemplates that each patrolman act as a sanitary inspector. This has been accomplished elsewhere without increasing the size of the police force and without interfering with the patrolman's usual duties.

It is thought that the chief and four sanitary police are sufficient for Youngstown and that one of the six should be transferred for milk inspection, thus giving the health department an additional milk inspector, who is badly needed.

THE HOUSING PROBLEM.

In the city of Youngstown the housing problem has become quite an extensive one because of the rapid growth of the city due to the expansion of the iron and steel industries in recent years. This has produced a large influx of foreigners to work in the mills. These people settle by races in different parts of the city, where facilities for taking care of numbers are poor. Overcrowding and insanitary conditions are therefore likely to occur. While the question requires more careful study than the writer was able to give, a few observations of a general nature were made. There are but few places that might be described as tenement houses and but few "flop" houses, but the boarding house is very common in the districts under consideration. Many of such houses are detached, so that there are windows on all sides and light and ventilation may therefore be obtained. Some, however, are built in rows on streets or in courts. The type of boarding house under consideration is usually operated by a man and his wife, who are frequently parents of a large family. Rooms are rented to the mill workers and the cooking is done for them at a small figure. There are usually three or four beds in each room, each bed being occupied by one individual during the day, and another during the night. Thus there are six or eight people to a room, one-half of whom sleep there during the day and one-half during the night.

Notwithstanding the activities on the part of the sanitary police to secure sewer connections, a number of places for one reason or another are not yet connected. This is one cause of the insanitary conditions. Another which was very noticeable was due to the collection of rubbish in the courts and yards. This of itself, while unsightly, was not insanitary except that in many instances there was clear evidence of the rubbish having been mixed with garbage, making a fly-breeding and rat-feeding center and producing a condition requiring

the attention of the health department. In many instances a proper garbage tin was not furnished.

In practically all of the houses visited the sleeping rooms were provided with one or more windows opening directly to the outside, giving adequate ventilation. Overcrowding can therefore not be called serious, provided that the windows are kept open and that there is no communicable disease introduced. Overcrowding implies close contact, which in the presence of a communicable disease is especially dangerous.

The majority of persons living under such conditions are young adult males, who must be physically fit to carry on the class of labor in which they are engaged. In fact, a study of the mortality tables which have previously been given shows that the death rate of the city is not high, but that the infant mortality rate is unduly large. The child under one year of age succumbs to conditions that have little influence over the health of the adult.

Modern dwelling houses have been constructed in several places in the city to rent for a reasonable figure. This scheme should be carried further. Much of the property in the foreign sections is really of little value and it would hardly pay to attempt any alterations or improvements. For this reason the houses should be demolished and small modern dwellings constructed to be rented to those in moderate circumstances. Where for any reason it is impracticable to obtain sewer connections, the health department should make an effort to have all outside privies screened against flies. A frequent collection by the city of rubbish as well as garbage would prevent the accumulation of such material in the courts and yards. Garbage tins should be required of every householder and an effort made to prosecute those who throw their garbage in unauthorized places. Regulations should be made to prevent overcrowding, and otherwise to regulate the use of any house as boarding, tenement, or "flop" house.

DISSEMINATION OF INFORMATION.

An annual report is issued by the board of health. This contains little or nothing of popular educational value. It is mainly statistical in nature and contains copies of recent ordinances or regulations pertaining to public health. The annual report has been limited, both as to size and distribution, by a lack of funds. In the case of tuberculosis a circular of information furnished by the State is sent to the patient.

It is necessary that the health department carry on an extensive educational campaign. It is suggested that probably the least expensive and most efficacious method would be the publication in

the newspapers of a popular article at least once each week explaining to the citizens the essentials of preventive medicine. The newspapers would no doubt be glad to cooperate in this matter.

RECEIPTS AND EXPENDITURES.

The money made available to the health department during the year 1915 from the general tax levy was \$41,220.54, as against \$158,601.79 for the service department and \$214,569.49 to the department of safety. Each of these departments also derives an income from other sources, as, for instance, license fees and the like, so that there was actually expended by the safety department during the year 1915, the sum of \$300,062.30, by the service department \$176,555, and by the department of health \$52,767.23. The latter figure includes a loan which was necessary on account of an epidemic of smallpox. This was paid back during the same year. The tabulation of expenditures shows that the health department actually expended for its maintenance \$46,600.63, including the emergency expenditures on account of smallpox. The difference between this and the \$52,676.23, quoted above, is accounted for by the payment of the loan. Excluding the emergency expenditures, it cost to maintain the health department during 1915, \$41,876.12, which represents just about the amount that it is entitled to from the general tax levy and is a sum entirely too small adequately to maintain the health department, when it is remembered that from that sum must be deducted \$22,514.99 to pay for the collection of garbage. In order that the health department may take up the active field work, which, because of the lack of funds and therefore the lack of necessary employees, it has been unable to do, it should receive not less than \$50,220 per annum, or \$9,000 per annum more than its customary allowance. Out of this sum should be paid a full-time epidemiologist at not less than \$2,500 a year and four full-time nurses at \$900 a year each. Four nurses would make a start and could do effective work especially if there could be effected a combination of all of the nurses in the city now doing public health nursing through private philanthropy. There should also be paid from this amount one additional inspector for food inspection, at \$900 per year.

Because of the lack of funds to advertise as required by law, the board of health has been unable to pass some much needed regulations or a sanitary code. This should be done without delay.

Tabulation of expenditures, calendar year 1915.

	General adminis- tration.	Epi- demi- ological.	Diag- nostic labo- ratory.	Regis- tration of births and deaths. ¹	Milk and food inspec- tion.	Sanita- tion.	Plumb- ing inspec- tion.	Total.
Badges.....						\$1.00		\$1.00
Binding.....	\$0.40		\$6.00	\$9.75				16.15
Books and periodicals.....	2.00		7.50			3.50		13.00
Drugs, chemicals, and disin- fectants.....		\$281.38	47.02					328.40
Dues to societies.....	8.00							8.00
Emergency services.....	6.00				\$3.00			9.00
Express, freight, and drayage.....	2.97		.96					3.93
Heat, light, and water.....	13.05							13.05
Insurance.....	2.86							2.86
Miscellaneous.....		.30			3.41	.75	\$1.30	5.76
Office furniture.....	102.20							102.20
Postage.....	81.00						10.00	91.00
Printing.....	53.00	7.25	13.00		79.50	32.95	57.75	243.45
Removal of dead animals.....						264.25		264.25
Removal of garbage.....						22,514.99		22,514.99
Repairs and alterations.....	13.00		21.65					34.65
Salaries:								
Health officer.....	1,000.00							
Bacteriologist.....			1,800.00					
Inspectors.....					2,160.00	6,900.00	3,120.00	16,420.00
Clerks.....	1,200.00						240.00	
Stationery.....	54.25		1.35	5.00			10.20	70.80
Supplies.....	5.53	8.50	153.47				.75	168.25
Telephone and telegraph.....	27.00						13.52	40.52
Towels.....			24.75					24.75
Transportation.....		22.15			329.25	440.30	659.36	1,451.06
Traveling expenses.....		17.00			2.10			19.10
Typewriters and repairs.....	2.25							2.25
Vaccinations.....		27.70						27.70
Total for ordinary ex- penses.....	2,573.51	364.28	2,075.70	14.75	2,577.26	30,157.74	4,112.88	41,876.12
EMERGENCY EXPENDITURES FROM SPECIAL BOND, ISSUE ON ACCOUNT OF SMALLPOX.								
Material and construction temporary isolation hospital.....		1,759.17						1,759.17
Supplies for hospital.....		440.94						440.94
Supplies, families in quaran- tine.....		861.65						861.65
Services:								
Attendants at hospital.....		309.50						309.50
Guards for the mainten- ance of quarantine.....		1,091.25						1,091.25
Physicians.....		262.00						262.00
Total expenses on ac- count of smallpox.....		4,724.51						4,724.51
Total ordinary and ex- traordinary expenses.....	2,573.51	5,088.79	2,075.70	14.75	2,577.26	30,157.74	4,112.88	46,000.63

¹ The expenses incurred in the collection of vital statistics are borne mainly by the State and county.

RECOMMENDATIONS.

As a result of the study of public health administration in Youngstown, certain definite conclusions have been reached and are made the basis of the following recommendations:

1. That for the purpose of administration the city health department be subdivided into the following divisions: The board of health, the executive office, division of epidemiology, division of milk and food inspection, division of sanitary inspection, and division of birth and death registration.

2. That a full-time epidemiologist be appointed to investigate the origin of each case of communicable disease occurring in the city, especially typhoid fever, scarlet fever, diphtheria, tuberculosis, and measles, so that preventive measures may be taken promptly at the source, the epidemiologist also to act as physician at infant-welfare stations and the like.

3. That as soon as the organization will permit there be established a sufficient number of infant-welfare stations and antituberculosis dispensaries to be maintained throughout the entire year.

4. That as soon as possible there be effected a combination of nursing forces in the city placing them in the health department under the direction of the epidemiologist.

5. That each nurse be given a district in which she shall perform all of the public health duties required.

6. That for administrative purposes the diagnostic laboratory be placed in the division of epidemiology under the supervision of the epidemiologist.

7. That a thorough study be made of and a better supervision be maintained over the milk supply of the city.

8. That to assist in maintaining this supervision an additional milk inspector be appointed by transferring one of the sanitary policemen.

9. That all of the market milk of Youngstown be pasteurized before being offered for sale to the public and that to insure the efficacy of pasteurization uniform methods be required.

10. That in order to prevent the spread of communicable diseases and to handle the child-welfare work and other public-health problems, there be added to the health department four sanitary policewomen with the qualifications of a public-health nurse, their duties to include the placarding of houses and the supervision of the prophylactic measures to be taken at the home as well as duties in connection with the reduction of infant mortality and similar measures.

11. That an additional inspector be added to the food and milk division, his duties to be the inspection of places handling food and the products sold therein.

12. That the cooperation of the police force be obtained to investigate nuisances and to issue the necessary orders to abate the same.

13. That as soon as practicable an isolation hospital be constructed with a capacity of not less than 50 beds, such hospital to be used for the isolation of the common communicable diseases, tuberculosis excepted.

14. That as soon as possible the city of Youngstown and the county of Mahoning arrange to transfer their interests in the five-county

hospital to the other cities and counties interested and that a tuberculosis sanatorium be built in Youngstown to care for the tuberculous of the city.

15. That all surface wells within the city be eliminated.

16. That water mains and street sewers be extended to all parts of the city as soon as possible.

17. That the health department furnish disinfectants free of charge to families in which there is a case of typhoid fever.

18. That at the expiration of the present contract the city organize its own system of garbage collection as well as rubbish collection. That the types of wagons adopted be such that they may be used for both garbage and rubbish.

19. That each householder be required to provide a proper garbage tin.

20. That the educational work of the health department be extended.

21. That automobile transportation be furnished for the use of the epidemiologist.

22. That adequate regulations be promulgated by the board of health to provide for the care of the communicable diseases, care and disposal of manure, the regulation of tenement and lodging houses, protection of food from flies, and the like.

23. That the laws and ordinances relating to public health and the regulations, rules, and instructions of the board of health be published for the benefit of the employees of the board, so that they may carry on their duties intelligently and understand their authority.

24. That all citizens of the city cooperate with the health department in its efforts to suppress disease and that physicians make special effort to report promptly all cases of communicable diseases.

25. That special effort be made on the part of the physicians and others to report promptly all births occurring in the city.

26. That there be appropriated for use of the health department the sum of \$50,220 per annum to defray the expenses of ordinary maintenance and an additional force to consist of one epidemiologist, four public-health nurses, and one food inspector.

27. That at some future date a full-time health officer be appointed; that he receive a salary of not less than \$3,500, and that his tenure of office depend upon efficiency.

28. That there be installed at the water-purification plant a method of treating the water with chlorine to be used as an emergency when the filters do not act with their usual degree of efficiency.